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ABSTRACT

Community Sustainability is a supplementary environmental education mini-curriculum for grades 9-12 designed to provide students with information about the emerging community sustainability movement as well as environmental action skills that will facilitate their participation. It contains interdisciplinary lessons that provide students with skills in math, science, language arts, social studies, history, visual arts, family studies, technology education, business education, and vocational education. Each section contains an introduction that gives basic background information and is followed by activities designed to illustrate a range of community sustainability concepts. "Sustainability Starting Point" provides an introduction to sustainability while "Sustainability Snapshot" gives students an opportunity to apply the concept of sustainability to their own communities. "A Peek at the Past" allows students to better understand the changes that have taken place within their community in recent years. "Looking Ahead" asks students to define the qualities they would like to characterize their community while the section "Monitoring Sustainability" provides a means for gauging the current status of the community. The final section, "Sustainability Service Projects", helps guide students' efforts to steer their community from its present state to its desired state. Appendixes contain a glossary and a community sustainability directory. (JRH)

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Community Sustainability

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"Sustainability is the goal of a system of development that meets the basic needs of all people without compromising the ability of future generations to meet their own life sustaining needs. Sustainability promotes the productive equilibrium between people and their environment by bringing both population and natural resource consumption into balance with the resource base."
-- Izaak Walton League of America, 1994

Community Sustainability

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FOREWORD

The Izaak Walton League of America is a national, nonprofit conservation organization with more than 50,000 members in nearly 400 chapters nationwide. The Carrying Capacity Project was established in 1993. It is an educational project working to bring the impacts of human population growth and natural resource consumption into balance with the limits of nature. The project has developed materials addressing national and international population and natural resource use issues, as well as community sustainability.

"Community Sustainability" is a supplementary environmental education mini-curriculum for grades nine through 12. It is designed to provide students with information about the emerging community sustainability movement, as well as environmental action skills that will facilitate their participation. It can be used by both science and nonscience teachers. Lessons are sequential and interdisciplinary. They provide students with skills in math, science, language arts, social studies, history, visual arts, family studies, technology education, business education and vocational education, among others. The core sections — Sustainability Starting Point through Monitoring Sustainability — can be implemented during a three-week period, depending on the intensity with which student research assignments are undertaken. The time required for the final section will vary, depending on the nature of the service learning project.

Each section provides an introduction that gives basic background information. The activities that follow are designed to illustrate a range of community sustainability concepts. Many of the activities are presented in outline form, as their actual procedures or topics will be student-directed. Ideas for extensions are included for each section and may be implemented in the classroom, assigned as homework, or omitted. Methods for evaluation are left to the discretion of the teacher.

Sustainability Starting Point provides an introduction to sustainability, and Sustainability Snapshot gives students an opportunity to apply the concept of sustainability to their own communities. A Peek at the Past allows students to better understand changes that have taken place within their community in recent years. Looking Ahead asks students to define the qualities they would like to characterize their community. Monitoring Sustainability provides a means for gauging the current status of the community. The final section, Sustainability Service Projects, helps guide students' efforts to steer their community from its present state to its desired state.

As with most projects of this kind, our ideas about the best ways to teach students about sustainability are strengthened by feedback from other educators. There is a teacher evaluation form at the end of this publication. Please help us by filling it out and sending it to us. Thank you.

Benedict and Diane Hren

PREFACE

"Community Sustainability" builds on two important, emerging trends in education reform: service learning and environmental education for sustainability.

Although students traditionally have been engaged in a variety of community service projects, service learning uniquely links community service and volunteerism with academic learning. No academic field is more crucial to the long-term well-being of our communities — and societies around the world — than environmental education for sustainability.

At the 1992 United Nations Conference on Environment and Development, also known as the Earth Summit, sustainability emerged as a central theme. This theme has been repeated in subsequent U.N. meetings addressing population, social issues, women and human habitat. The Earth Summit's Programme of Action, better knows as Agenda 21, maintains that "Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues. . .It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behavior consistent with sustainable development and for effective public participation in decision-making."

Contemporary environmental education emerged in the 1980s. It has been defined by the National Consortium for Environmental Education and Training as "a way of teaching that makes connections between science, technology, economics, policy, people and the environment." Environmental education "addresses inter-relationships between humans and the environment," according to the group, "and is concerned with values and skills, as well as knowledge."

Although contemporary environmental education advocates teaching about values, the emerging model of environmental education for sustainability advocates teaching values themselves. Values that promote the human rights of current and future generations and the importance of biodiversity are as essential to sustainability as values that traditionally are taught to strengthen democracy. Environmental education for sustainability is strongly proactive and addresses the long-term social, economic and environmental effects of contemporary decision-making.

By combining these elements with service learning, students gain insight into local political processes. They develop democratic skills and values that are needed to address issues about natural resource consumption, poverty, environmental quality, conservation, economic development, social justice and equity.

SUSTAINABILITY STARTING POINT

SUSTAINABILITY STARTING POINT

Subjects:
environmental science, language arts, social science

Vocabulary:
carrying capacity, consensus, development, environment, environmental justice, human resources, integration, natural resources, stewardship, sustainability, sustainable development, transformation

Objectives:
Students will be able to: 1) define sustainability, 2) define sustainable community development, and 3) describe the process through which sustainability may be achieved

Method:
Using a jigsaw cooperative learning strategy, students will build a foundation of understanding for a series of activities

Materials:
Student Pages (expert group pages 1 - 5 and base group Summary Questions), pencil

Background:
Sustainability is a comprehensive approach for creating an environmentally sound world for ourselves and generations to come. It has emerged recently as the newest goal of nations and communities around the world.

For conservationists, sustainability is nothing new. It's a basic principle for natural resource management. Policy-makers also have thought about sustainability for the last three decades. But it was not until a United Nations conference in 1987 that sustainability achieved the high-profile exposure it needed to capture the world's attention.

That year, the United Nations convened the World Commission on Environment and Development. Headed by Norwegian Prime Minister Gro Harlem Bruntland, the "Bruntland Commission" concluded that the world was facing a serious threat brought on by unsustainable development.

The Bruntland Commission provided the world with this concise definition of sustainability: "development that meets the needs of the present without endangering the ability of future generations to meet their own needs."

Elizabeth Kline of Tufts University views sustainability as a combination of four things: economic security, ecological integrity, quality of life, and empowerment and responsibility. These elements provide the framework for a stable economy and communities that live in harmony with the natural environment, support a high quality of life, and give people decision-making responsibility.

Other interpretations of sustainability are specific to a certain community's needs. For example, the nonprofit organization Sustainable Seattle currently is developing a sustainability plan for its growing metropolitan area. The plan characterizes sustainability as development that promotes "long-term cultural, economic and environmental health and vitality."

Vice President Al Gore first coined the term "sustainable community development" in reference to the U.S. Department of Housing and Urban Development's Enterprise Community Program. The term was defined formally during the 1994 White House Conference on Environmental Technology. There, a panel on partnerships for sustainable communities described sustainable community development as development that "guides the social, economic and ecological rebalancing of urbanization within the dictates of natural ecology."

There are as many definitions of sustainability and sustainable community development as there are individuals, organizations and governments working to achieve long-term, environmentally conscious development strategies. However, there are fewer concrete examples of how sustainable community development will work or what it will look like. The solutions to sustainable community development are likely to be determined by the generation of community innovators who are students today.

Procedure:

1) The following reading exercise provides an overview of community sustainability. It is divided into five expert group readings:
A Defining Time — Expert Group 1
Tomorrow's Technologies Today — Expert Group 2
Sustainability Begin at Home — Expert Group 3
Bringing Sustainability Home — Expert Group 4
A Sustainability Report Card — Expert Group 5

2) Organize students into "base" groups of five. Give each student in the base group one of the five expert group readings.

3) Have students regroup, by the readings they received, into one of five "expert" groups. Explain that students will read and discuss within expert groups the readings they have been assigned. Organize the section groups of students in different areas of the classroom. Within the expert groups, students first should examine the readings, then work cooperatively to answer the "focus on the facts" questions. They should use this time to discuss the information and prepare to present it to members of their base group.

4) Ask students to re-form their base groups. Beginning with reading one, each student "expert" should explain the focus of his/her reading to other members of the base group.

5) Have students put away all reading material and notes. Distribute a summary sheet to each base group. Ask the students to work together, using their expert and cooperative knowledge, to complete the summary questions.

6) Discuss and review the student summary questions.

Extensions:

1. Introduce the concept of sustainability by viewing and discussing "Sustainable Environments." The video provides an excellent introduction to the ecological principles of sustainability and shows how these can be applied to issues relating to transportation, buildings and landscapes, diet and agriculture, and lifestyles and work.

2. Have students locate, read and review current newspaper articles about local community development. Do these projects promote resource conservation, either through technology efficiency or consumer behavior modification? Do they have the broad support of all members of the community? How do they integrate and address environmental, social and economic issues? Do they contribute to sustainability?

Resources:

"Choosing a Sustainable Future: The Report of the National Commission on the Environment," 1993, published by Island Press, Washington, D.C.

"Lessons from Nature: Learning to Live Sustainably on the Earth," by Daniel Chiras, 1992, published by Island Press, Washington, D.C.

"Our Common Future: The Report of the World Commission on Environment and Development," 1987, published by Oxford University Press, New York, N.Y.

"Sustainable Environments," 1995, video available from San Luis Video Publishing, P.O. Box 6715, Los Osos, Calif. 93412

"Sustainable Worlds," in Nature Conservancy, January/February 1995, available from Nature Conservancy, 1815 North Lynn St., Arlington, Va. 22209.

A Defining Time

Expert Group 1

The term "sustainability" has been used by conservation professionals for several decades, but it was not until 1987 that it gained worldwide attention. That is when the World Commission on Environment and Development — convened by the United Nations — issued its final report, titled "Our Common Future." The report was based on four years of research and public hearings aimed at finding global solutions to the problems caused by environmental degradation. In the report, the commission called for "sustainable development" as a planetary goal. The commission also provided the world with a concise definition of sustainability: the goal of a system of development "that meets the needs of the present without endangering the ability of future generations to meet their own needs."

In a world working to achieve sustainability, people can draw on the Earth's life support systems — croplands, forests, energy, clean air and water — without degrading these systems to the point where these resources no longer can support future generations. This means renewable natural resources like trees, ocean fisheries and freshwater should not be used faster than they can be replenished. Nonrenewable natural resources like coal, oil and mineral reserves should be used sparingly until new technologies can provide alternative, environmentally clean sources of energy and raw materials. In addition, human populations should not be so large that meeting basic human needs damages the environment.

The World Commission on Environment and Development established several key principles of sustainability. First, it stated that the needs of the future must not be sacrificed to the demands of the present. In other words, we should not use up natural resources or change the natural environment in any way that would jeopardize future generations' chances of having enough food, water or opportunities for outdoor recreation. Second, the commission recognized that a healthy environment and a healthy economy go hand in hand. The environment and its natural resources are the source of our monetary wealth, and money-making activities that damage the environment harm future money-making opportunities. Finally, the commission concluded that protecting the environment would be difficult unless we improve the living conditions of the Earth's poorest people. Without jobs, money, food, water and energy resources, people who live in poverty use their local resources to survive, with little concern about conservation or the needs of future generations.

As part of a local response to this global call for action, people across the United States and around the world are engaged in successful efforts to move their neighborhoods, towns and cities toward a sustainability. Those in the community sustainability movement believe that a strong economic future depends on conserving natural resources and promoting democratic principles that value the contributions and opinions of every member of the community.

FOCUS ON THE FACTS

1. What is the definition of sustainability?

2. Describe the key principles of sustainability.

3. How could sustainability benefit you?

Tomorrow's Technologies Today
Expert Group 2

Half the world's people will live in urban areas by the turn of the century. Already, nearly 90 percent of Americans live in urban areas. The U.S. population is projected to grow from 258 million people in 1995 to as many as 325 million by 2020. The ways communities plan for the future will determine humankind's success or failure in preserving the environment and achieving sustainability. Sustainability is the goal of a system of development that provides jobs, food, freshwater, a place to live, clean air and a healthy environment for people, today and in the future.

Most U.S. cities were built using technologies that assumed that abundant and cheap energy and land would be available forever. Large-scale construction projects turned farmland into tracts of suburban housing and covered wetlands with shopping malls, parking lots and roads. Communities became dependent on long-distance transportation for the delivery of basic natural resources like food, water and energy. Other consequences of suburban sprawl are air pollution, loss of wildlife habitat, population declines in inner cities and traffic congestion.

Fossil-fuel technologies that provided inexpensive energy influenced the construction of our spacious homes, office buildings and shopping malls. Inexpensive gasoline bolstered our dependence on the automobile and increased the distance between our workplaces and our homes. Per-capita gasoline consumption in U.S. cities is now more than four times that of European cities and about 10 times greater than Asian cities such as Hong Kong and Singapore.

We also are squandering natural resources through excess packaging of consumer goods and by the production of large amounts of disposable products. These contribute to a mounting garbage problem and a lack of landfill space in communities from coast to coast. Even using conservative projections for U.S. population growth, the U.S. Environmental Protection Agency reports that 80 percent of all landfills will be at full capacity within the next 25 years.

The ecological costs of our environmentally unfriendly technologies are astonishing. Each day, a typical city of 100,000 people imports approximately 200 tons of food and 1,000 tons of fuel. It also generates nearly 275 tons of garbage. And the U.S. population is growing by about 3 million people each year.

Some of the greatest challenges for communities working toward sustainability are stabilizing human population growth and investing in technologies that are more energy-efficient and less polluting. This may include reducing teen pregnancy rates, improving public transportation, and using renewable energy supplies. Communities also must work toward more efficient land use patterns to reduce impact on natural resources. Citywide recycling and tree-planting projects also are important efforts toward achieving the balance of people, resource use and environmental protection required for community sustainability.

FOCUS ON THE FACTS

1. What is the definition of sustainability?

2. How does the way we use technology affect our environment and economy?

3. How could advanced technologies and the more efficient use of natural resources benefit you?

Sustainability Begins at Home

Expert Group 3

As the saying goes, people are either part of the problem or part of the solution. In many communities across the country, rapid population growth, overburdened landfills, depleted natural resources, and water and air pollution are viewed as problems. But sustainability may provide the solution. Sustainability is the goal of a system of development that provides for the natural resource needs of current and future generations without harming the environment.

On a personal level, we can help our communities move toward sustainability by adopting lifestyles that reduce our individual impact on global and local resources. This includes decisions about everything from the desired size of our families to how we make a living, how we get from place to place, and how much and what we buy. Changing our lifestyles and patterns of behavior isn't easy. High consumption levels have become the ultimate measure of personal success. "Growth is progress" and "the bigger the better" are inherent principles in the pursuit of the American dream. Everyone wants the latest clothes, the newest high-tech home entertainment equipment, and the fastest car.

Although Americans comprise only 5 percent of the world's population, we use 25 percent of the world's resources and produce a disproportionate amount of waste and pollution. We throw away too much. There is a daily avalanche of solid waste generated by Americans -- nearly 4 pounds per day for each man, woman and child, or a total of 400,000 tons per year. Nearly one-third of what we throw out by weight -- and nearly one-half by volume -- is packaging. Despite the array of recycling possibilities, about 75 percent of this waste is transported to landfills, which rapidly are approaching capacity levels. As more communities adopt recycling programs, we will reduce the need to extract raw materials from remote and fragile parts of the planet.

Altering our transportation habits also could have an enormous impact on sustainability. More than six of every 10 barrels of oil are dedicated to transportation needs in the United States. Travel by personal car uses nearly four times as much fuel per person per mile as travel by bus, train or van pool. But two out of every three Americans still drive alone during their daily commute to work.

We also can reduce our energy appetite by choosing to make energy efficiency part of our homes and a deciding factor in our purchases. For example, replacing a 75-watt incandescent bulb with a new 18-watt fluorescent one will produce the same amount of light while saving approximately 400 pounds of coal and significantly reducing the release of sulfur dioxide and carbon dioxide into the air throughout the lifetime of the bulb.

As Americans begin to recognize the enormous financial savings that less waste and more efficiency can provide, more energy-saving methods are becoming part of everyday routines.

FOCUS ON THE FACTS

1. What is the definition of sustainability?

2. What common ideas contradict the principle of sustainability? Explain.

3. What personal lifestyle choices could you make to help contribute to sustainability?

Bringing Sustainability Home
Expert Group 4

The U.S. economy has seen spectacular growth during the past several decades. Since 1950, our economy has quadrupled in size, and the U.S. population has grown by 70 percent. Although many people hail our economic gains, others are concerned that growing human populations and expanding economic activity will overuse natural resources and inflict environmental damage.

In addition, these economic successes tell us nothing about the distribution and equity of wealth and development among U.S. citizens. U.S. per-capita income has continued to grow during the past 40 years, but so has the economic gap between rich and poor Americans. Today, the richest fifth of U.S. households earns 48 percent of the nation's income, while the poorest fifth earns less than 4 percent. Traditional methods for measuring human progress -- how much money we make, the number of new houses constructed, and the number of people without jobs -- tell us little about the qualities of people's lives.

Traditional development -- whether at the national or community level -- often disregards environmental impacts. Worse, development often occurs without the input from many members of the community, including environmental and health experts, community activists and people of color. The result has been development that benefits only a few and increased divisiveness among different segments of the community. Business comes to resent government. The environment and jobs are placed at odds. Toxic waste dumps are placed in minority and low-income neighborhoods. Everyday citizens generally are left out of the picture altogether.

Community sustainability turns old ways of thinking upside down. It brings a whole new commitment to the principles of democracy and environmental and social justice. It requires full public participation by all concerned citizens -- particularly from minority communities -- and makes a safe and healthy environment for everyone a top priority.

Full participation in community development decision-making creates consensus and a sense of ownership. This is a critical element for community sustainability. For example, citizens may not support recycling efforts if they have no voice in the development of these and other conservation initiatives.

Finally, community sustainability respects the needs of future generations by taking a long-term approach to land planning. At present, many cities' elected officials feel pressure to offer their citizens short-term benefits. For example, paving over a wetland to build a shopping mall works against sustainability efforts. Widespread citizen participation in a community's decision-making process can help promote long-term thinking by including factors other than short-term financial considerations. This could have a profound effect on the future quality of life in communities all over this nation.

FOCUS ON THE FACTS

1. Create a graphic to show the distribution of wealth among U.S. citizens.

2. What roles do democracy and social justice play in sustainability?

3. What could you do to promote active involvement in decision-making among all the members of your community?

A Sustainability Report Card
Expert Group 5

What measures can communities use to chart their progress toward sustainability? People in dozens of cities from Jacksonville, Fla., to Seattle, Wash., have developed a set of sustainability indicators to chart their communities' environmental, social and economic vital signs. An indicator is a data point that reflects the status of a larger system. For example, because birds are a visible and easily identifiable part of regional ecosystems, the number of bird species in a local bird count is an indicator of the area's overall biodiversity.

Some indicators can be measured directly by using official sources, such as government data. These might include information about air quality or population growth. Others are based on physical measurements that citizens must perform themselves, such as data collected in stream monitoring programs. Still other indicators can be measured only through community surveys, such as the percentage of the population that performs volunteer work.

Indicators vary from community to community but may be grouped into one of three general categories. The first is environmental. A community striving for sustainability works in harmony with natural systems by reducing waste and consumption and by protecting and preserving air, water and land resources. Examples of indicators in this group include water quality measurements in local waterways, acres of wetlands and forest, and regional biodiversity.

Economic factors comprise the second category. They includes obvious indicators such as unemployment rates and per-capita income. They also include indicators that reflect the impacts of economic activities, such as pounds of solid waste landfilled per person per year and acres of land available for agriculture.

The third category includes social indicators. These indicators are associated with a sense of well-being and security shared by residents and include population, health, education and safety statistics. Some examples are total human population and annual population growth rates, the percent of the population 18 or older voting in elections, and the percent of students receiving environmental education.

There are several characteristics that describe a good indicator. First, when possible, indicators should measure results rather than effort. For example, an indicator should measure the number of literate adults rather than the amount of money spent on literacy education. Second, different communities should be able to compare their indicators with one another. Third, indicators should be reliable for up to two decades. Fourth, indicator data should be easy to gather and analyze at regular intervals. Finally, indicator data should come from reliable sources.

Indicators themselves cannot create change, but they are effective tools to help communities identify critical areas of concern and to assess their efforts toward making the transition to sustainability.

FOCUS ON THE FACTS

1. What is the definition of an indicator?

2. Name and describe three categories of indicators.

3. How could you use information from indicators to help make your community a better place to live?

SUMMARY QUESTIONS
Base Group

1. What is the definition of sustainability?

2. How can sustainability improve your future?

3. What can you do to contribute to sustainability?

4. What can your community do to contribute to sustainability?

5. Explain how the following statements could help you describe the concept of sustainability to someone who is unfamiliar with the idea.

"It is thrifty today to prepare for the wants of tomorrow."
-- Aesop's Fables, The Ant and the Grasshopper

"We are caught in an inescapable network of mutuality, tied in a single garment of destiny. Whatever affects one directly affects all indirectly."
-- Martin Luther King

Sustainability is the goal of "a system of development that is ecologically sound, economically profitable, socially equitable and politically supportable."
-- James Enote, Pueblo of Hopi

Consider each decision's impact on the seventh generation.
-- adapted from an Iroquois Nation principle

SUSTAINABILITY SNAPSHOT

SUSTAINABILITY SNAPSHOT

Subjects:
environmental science, language arts, social science, visual arts

Vocabulary:
economy, environment, society, sustainability

Objectives:
Students will be able to
1) describe how economic, social and environmental factors affect sustainability, 2) illustrate the concept of sustainability using a variety of graphic images; and
3) describe how these images represent sustainability.

Method:
Students will complete a webbing exercise that illustrates the linkages among economic, social and environmental factors and create mixed-media images that represent their understanding of the concept of sustainability.

Materials:
colored chalk, student page (Sustainability Snapshot), pencils, colored markers, scissors, paste, magazines, newspapers, poster-size paper, photo corners (optional), camera/film (optional)

Background:
Carrying capacity is the measure of an area's ability to support an optimum population at a given level of natural resource consumption and technology. Consequently, sustainability is fundamental to preserving the area's long-term environmental integrity and renewable natural resource productivity.

Sustainability is the goal of a system of development that recognizes environmental limits and seeks to provide natural resources to support current and future generations in ways that do not damage the environment. Although sustainability now is widely recognized as a requirement of development, the means for achieving sustainability seem elusive in a world where rising human population and expanding natural resource use are inevitable.

Sustainability requires three fundamental changes. Individual behavior changes are first. These modifications can be achieved through education and include redefining desirable family size and reducing natural resource consumption by individuals.

Second, changes in science and technology are required. Many of our current technologies use natural resources inefficiently and create waste. Technologies that mimic natural systems in their conservation of resources and interrelationships among physical, chemical and biological processes offer the best opportunities to achieve sustainability.

Third and most importantly, sustainability requires changes in the way we view economic, social and environmental systems and how we address them through local, state and national government policies. We traditionally have viewed these systems as discrete entities. Accordingly, we designed governmental departments to address commerce, justice and the environment, for example. However, we now recognize that issues as complex as conservation have economic, social and environmental components that cannot be addressed independently.

Many people argue that to achieve sustainability, the environment cannot be viewed as a competing interest with economic and social issues. In a model designed truly to promote sustainability, the environment must be viewed as the common ground on which economic and social issues interact.

This shift from a human-centered approach to sustainability will not be replaced easily with an environment-centered approach. Such an approach threatens the way we currently look at land ownership and private property rights, among many other institutional practices.

Although we recognize that the environment's natural resources are the source of our material wealth, we have not come to grips yet with the idea that all the planet's resources are not for human consumption. Sustainability recognizes that all life forms must be conserved to provide diverse natural resources for the future.

Values that strengthen democracy, promote human rights, advance environmental justice, build respect for biodiversity, and ensure a high quality of life in the future all are essential for sustainability.

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Procedure:

1. Identify a major economic activity -- not a specific business or company -- in your community. Write down the activity in the center of a large piece of poster paper or in the center of the chalkboard. Examples of economic activities include farming, manufacturing, forestry and fishing.

2. Conduct a webbing exercise by having students identify the primary economic, social and environmental factors that affect or are affected by that economic activity. Different colored markers or chalk may be used to designate economic, social and environmental factors. Then identify the secondary economic, social and environmental factors that affect the primary factors. Identify third- and fourth-level factors if possible. Keep the ideas simple and don't take time to make value judgments about the factors or worry about redundancy or organization. When you are done, you should have a diagram that reflects the complexity and interconnectedness of economic, social and environmental factors. (See the webbing exercise example in the lower right corner of this page.)

3. Next, identify the natural resource that is most critical or most likely to be in shortest supply in the future for the economic activity described in the webbing exercise. Write the name of the natural resource in the center of a large piece of poster paper or in the center of the chalkboard. Examples of key natural resources include freshwater or a particular mineral or metal used in manufacturing.

4. Do a second webbing exercise by having students identify possible and/or probable primary economic, social or environmental effects of this natural resource shortage or depletion, as well as some new developments that this resource shortfall may create or necessitate. Think about all of the people in your community who would be affected by this situation. Then, as in Step 2, identify second-, third- and fourth-level effects.

5. Economic activities in communities across the country have been affected by the exhaustion of natural resources. Sustainability is the goal of a system of development that provides resources for current and future generations, while conserving the environment. Have students -- working individually, with a partner or in small groups -- select another economic activity in their community (or use the economic activity from the webbing exercise) and conduct research to determine whether it is sustainable in its present state. What can students change to improve the activity's sustainability? How will these changes affect the members of the community, today and in the future?

6. Have students find pictures in magazines or newspapers (or create their own images using drawing materials or photography) that represent a "snapshot of sustainability" for this economic activity. Students should use their creativity to select or create images that show how the economic activity could be managed so that it provides benefits and jobs for years into the future, while conserving the environment and contributing to the well-being of the community. Have students arrange these images around the sustainability snapshot graphic or on a piece of poster paper.

7. Have students present their sustainability snapshot projects to the class.

Extensions:

1. Have students write to a local business engaged in the economic activity depicted in the students' sustainability snapshot projects. They may inquire about the sustainability strategies being used by the business and offer to provide their posters for display.

2. Complete the sustainability snapshot activity using computer equipment (scanner, digital camera, Internet access, etc.) and graphics software.

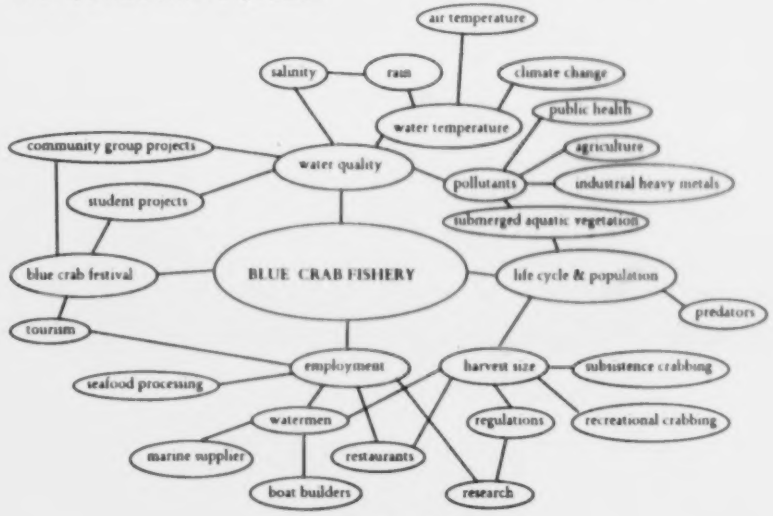
Resources:

"A How-to Guide for Sustainable Business," by David Newport, 1995, available from the Environmental Education Foundation of Florida, P.O. Box 10688, Tallahassee, Fla. 32302.

"Economic Renewal Guide: How to Develop a Sustainable Economy Through Community Collaboration," by Michael J. Kinsley, 1994, available from the Rocky Mountain Institute, 1739 Snowmass Creek Road, Old Snowmass, Colo. 81654.

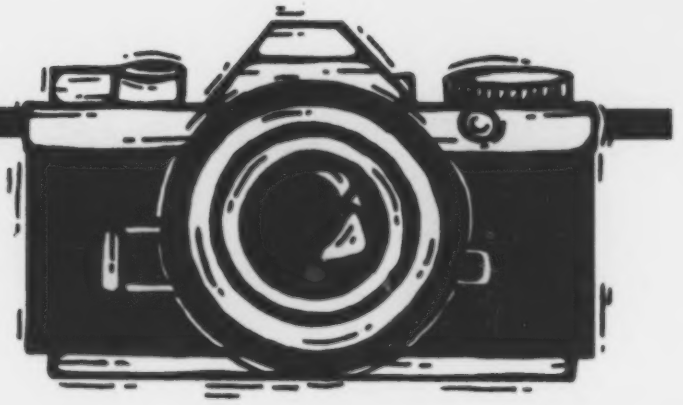
"To Ensure the Nation's Future: Sustainable Development and the U.S. Department of Commerce," 1994, available from the U.S. Department of Commerce, Office of Policy and Strategic Planning, Room 5415, 14th St. and Constitution Ave. N.W., Washington, D.C. 20230, or by Internet e-mail: sdev@doc.gov.

"Toward Sustainable Communities," by Mark Roseland, 1992, available from the Canadian National Round Table on the Environment and the Economy, 1 Nicholas St., Suite 1500, Ottawa, Ontario K1N 7B7, Canada.



Webbing Exercise Example

SUSTAINABILITY SNAPSHOT



A PEEK AT THE PAST

A PEEK AT THE PAST

Subjects:
environmental science, language arts, social science

Vocabulary:
demographics, human resources

Objective:
Students will be able to describe the qualities of their communities that longtime residents believe are important to restore or maintain as the communities continue to change.

Method:
Students will prepare questions, interview longtime residents of the communities in which they live, and make class presentations about their findings.

Materials:
pencil, paper, tape recorder (optional), video recorder (optional), water and cups, guest name cards

Background:
Although change is an unstoppable natural process, development is human-directed and guided by a set of values. Development may involve a quantitative shift from one size to another. It may also involve a transition in the qualities of people's lives from one state to another.

Quantitative changes can be measured using data about population size, economic activity or environmental status. Qualitative changes often are more difficult to perceive and even more difficult to measure. Sustainability, which may involve quantitative change, is about improving the qualities of people's lives while simultaneously conserving the environment.

Sustainability is not about sustaining growth and increasing expectations for natural resource consumption, but it also does not promote deprivation. In a 1994 interview with the Izaak Walton League of America, Worldwatch magazine author Alan Durning said that, "As we move toward a post-consumer society, we'll figure out better ways to do things with the resources we consume. We'll move to a vision far better than anything we can image right now because Americans are enormously resourceful people."

"The basic technologies that have been around for a long time, combined with some new, advanced technologies, will provide many services to consumers without using a lot of resources," he said. "For example, we might see a future where people ride more bicycles and use more laptop computers; where we have more satellite dishes for telecommuting and more clotheslines; where people eat fewer high-fat foods and live longer as a consequence; where we would participate in home and community activities that take time."

"Enjoying time," as opposed to "spending time," is a concept that has been lost in many communities where people view time as money. There has been a recent transition from communities in which happiness was defined by a balance of social relations, work and leisure activities to communities in which happiness is measured by material wealth and career achievement. In fact, many members of our communities can recall times when social bonds between community members were strong, when community members depended on one another rather than on services purchased through commercial businesses, and when visiting neighbors, regularly sharing family meals and simple conversation, enriched the qualities of their lives.

The golden rule of sustainability is that each generation should meet its needs without jeopardizing the prospects for future generations to meet their own needs. A first step toward observing this rule is defining needs that are most important to community members. We can start by defining the qualities of a community -- past or present -- that are worth restoring or preserving, then developing strategies for working collaboratively to promote their restoration or preservation.

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Procedure:

1. Ask students what they think life was like in their community 50 years ago. List their ideas on the chalkboard or on a flip chart. Be sure to record these observations on paper for reflection at the conclusion of this activity. Have the students think about the community's population, both its size and demographic characteristics. What were the major businesses and industries? How did people earn a living? How much of their weekly wages were spent to meet basic food, housing, health and education needs? What courses were offered in local high schools?

2. Have students form teams or work groups to research these ideas using local media resources. Ask students to report their findings to the class.

3. What questions about life in their community were the students unable to answer through their research? Could some of these questions be answered through interviews with people who have lived in the community for many years? What other questions could the students ask? Might different residents of the period recall events in different ways?

4. Have students generate a list of community residents they know (parents, grandparents, relatives, youth group leaders, church members, business owners, government officials, etc.) who have lived in the community for 40 to 50 years and who could be interviewed about life in the community in the past. Ask the students to decide which community residents to invite to the school and be interviewed about the community's history. Have students write letters of invitation or develop an outline for a telephone invitation. Set a time and place (probably your classroom) and give the guests an idea about the kinds of questions they will be asked. A broad theme for questions may be the community qualities — past or present — the guests believe are most important to restore or preserve. Guests can be invited to come at different times, or they could be interviewed as part of a panel. Ask the guests for a little bit of information about themselves in advance so the students can introduce them at the beginning of the meeting.

5. Prepare for the meeting by having students: identify topics for discussion; determine how many questions can be asked in the time allotted for the meeting; develop questions; and identify which guests the questions will be directed toward. Develop a meeting agenda with a specific time schedule that includes introductions of the guests, the teacher and the class, a presentation by a class member about the project, time for questions and answers, and closing remarks and thank yous. Identify a student to host the meeting. This student should be responsible for keeping the class on task and making sure that everyone keeps within the allocated time for each part of the agenda. Decide in advance if the meeting will be recorded on audio or video tape or if students are going to take notes. Make the appropriate arrangements to reserve the needed supplies. You may invite school administrators or local government representatives to be part of the audience. Have students make name cards for the guests and assign students to greet the guests the day of the meeting.

6. Conduct the meeting. Make sure students are prepared and understand their roles. Set up the room so the guests are comfortable and can see all of the students. Have assigned students greet the guests at the visitor sign-in area of your school and escort them to the meeting location. Provide water and drinking glasses for the guests. Other refreshments are optional. Have the student host begin by reviewing the agenda, setting ground rules for guests' responses (including time limits for responses) and the audience's questions, then asking the designated students to introduce the guests. The host should make sure the agenda remains on schedule and should be tactful but forceful in keeping the interview within the designated time. Running over time is unfair to students who cannot ask their questions because time has run out. It's also unfair to guests who may have other commitments. Conclude the meeting by providing the guests with a few moments to make closing remarks (if they choose) and by thanking them for their participation.

7. After the meeting, have students discuss or write about what they learned about their community. Is what students found out different from or similar to the items on the list they generated before the meeting? Did the guests' remarks change the students' views of their communities? If so, how? What did students learn from their guests about making their communities better places to live?

8. Write thank-you letters to the invited guests.

Extensions:

1. Have students design visual presentations about the community qualities they feel are most worth restoring or preserving in their community. Display the posters in the classroom or in another public place.

Resources:

"How Much is Enough?," by Alan Durning, 1992, available from Worldwatch Institute, 1776 Massachusetts Ave. N.W., Washington, D.C. 20036.

"The Experience of Place," by Tony Hiss, 1990, published by Random House, New York, N.Y.

LOOKING AHEAD

LOOKING AHEAD

Subjects:
environmental science, language arts, social science

Vocabulary:
scenario, visioning

Objectives:
Students will be able to: 1) make predictions about life in the future, 2) write about an ideal day in their life 20 years in the future, 3) identify forces that may threaten or enhance their vision for the future, 4) suggest ways they could minimize these threats and promote the positive forces, and 5) appreciate diverse hopes and aspirations as a tool for developing proactive action strategies.

Method:
Students will work individually and cooperatively in small groups to complete a visioning exercise. They will share their results with the class.

Materials:
index cards (or 3- by 5-inch pieces of recycled paper), masking tape, pencils, paper

Background:

A delineating characteristic of environmental education for sustainability is the value it places on making decisions that fully account for the needs of future generations. Traditional environmental education focuses on solving environmental problems after they have occurred. Environmental education for sustainability focuses on the proactive improvement of the future environment with an emphasis on providing for human needs within an environment-centered framework.

Most future-oriented thinking is undertaken by professional economists, land planners, scientists and policy analysts. Our society's vision of its future plays a powerful role in shaping decisions about the way we live, the types of available employment, and the way we spend our time when not at work. Our vision of the future has changed dramatically during the past 20 years. Technology has advanced, systems of government have changed, and our national security has been challenged. World population has grown exponentially, and the environment has been altered on a global level.

As these changes emerge, it is becoming evident that those responsible for shaping our future are prepared to address the scientific and technological changes that may take place. However, they are not as well prepared for, or as willing to address, the cultural and social changes that will shape our future.

Students' expectations for the future are shaped by events happening around them. Today, world issues like political insecurity, poverty, hunger and climate change are shaping bleak views of the future. Local issues like crime, unemployment, pollution, racism and homelessness are having a similar effect. This generally has lead to few expectations for a future that is better than the present. This kind of thinking drives the pursuit of short-term benefits that characterize a range of environmentally, socially and economically harmful activities.

Visioning -- projecting the positive and negative aspects of life at some time in the future -- is an important tool for achieving sustainability. Negative forces can be addressed proactively by identifying the forces that may threaten or enhance the future and developing a preferred scenario. Similarly, assets can be identified and developed to enhance the prospects of life for current and future generations.

Students hear and read about other people's visions of the future more than they talk or write about their own. Visioning and scenario development are effective tools for initiating proactive, issue-based learning. These activities provide useful first steps in identifying topics that are relevant to students and their hopes and aspirations. From this point, the process of researching an issue, seeking solutions, carrying out actions, and evaluating the impact of these actions becomes more meaningful and effective.

Procedure:

1. Pass out three to five index cards (or 3- by 5-inch pieces of recycled paper) to each student, depending on the size of the class and the time available for this activity. On each card, have students write one assumption about what life will be like 20 years from now. For example, a student could write, "There will be fewer parks." Note that these assumption also may be positive. For example, a student could write, "Our community will set aside additional land to be preserved as parks."

2. Collect the cards. Randomly pass out the cards to the students, one by one. Have them read a card to the class. With help from the class, group the cards about related assumptions as they are read. Tape the cards on the wall in their subject groupings. The groupings should be placed in parallel horizontal rows. For example, one grouping that may emerge may be positive assumptions about the environment. Another grouping may be negative assumptions about the economy.

3. Review the assumptions and the groupings.

4. Pass out another index card (or 3- by 5-inch piece of recycled paper) to each student. Have them write vision statements -- a three- to five-sentence paragraph about what a good day in their life would be like 20 years from now.

5. Collect the cards. Randomly pass out the vision cards, one per student. Have each student read a card and line up the cards in a horizontal row, to the right of and below the rows of the assumption cards. Discuss how each assumption subject grouping may promote or threaten a vision.

6. Have the students retrieve their own vision cards and write about the class's ideas. Students can write about the actions they could take to promote the visions and minimize or eliminate the threats.

7. Have students share these action ideas with the class.

Extensions:

1. Ask the class to list the current strengths and weaknesses of our environmental, social and economic systems and identify ways they may affect the students' action ideas. Discuss how these could be changed.

2. Have students write expanded individual vision statements. Ask them to illustrate these statements in a poster, other visual media, or through music.

Resources:

"Exploring the Future: A Missing Dimension in Environmental Education," by David Hicks and Cathie Holden, 1995, published in Environmental Education Research, Vol. 1, No. 2, Oxford, United Kingdom.

"Securing Your Future: Pathways to Community Sustainability," by Ben Hren, Nick Bartolomeo and Michael Signer, 1994, available from the Izaak Walton League of America, 707 Conservation Lane, Gaithersburg, Md. 20878.

"State of the Community," 1993, available from the Sustainable Community Roundtable, 2129 Bethel St. N.E., Olympia, Wash. 98506.

MONITORING SUSTAINABILITY

MONITORING SUSTAINABILITY

Subjects:
environmental science, language arts, math, social science

Vocabulary:
indicator, monitor, per capita

Objective:
Students will be able to define an indicator and identify several indicators that can be monitored in their community using available data.

Method:
Students will conduct a community sustainability monitoring project and report their findings to their class and community.

Materials:
pencil, student pages (Community Sustainability Indicators), poster board, colored markers

Background:

"Building a sustainable society does not mean reverting to a primitive existence," wrote Daniel D. Chiras, author of the 1992 book, "Lessons from Nature." "The challenge is to find a new synthesis that melds the wisdom of nature with human institutions and technologies and lifestyles."

All across the nation, communities are becoming involved in the effort to find this new synthesis. They've undertaken projects to recycle wastes, stabilize population, improve energy efficiency and restore and conserve natural landscapes. Although these individual activities can't guarantee sustainability, together they can help move a community toward that goal.

One way to know if your community's activities are promoting sustainability is to conduct a community sustainability monitoring project.

What is sustainability? The Izaak Walton League of America defines sustainability as the goal of a system of development that meets the basic needs of all people without compromising the ability of future generations to meet their own life-sustaining needs. Seattle, Wash., which has a well-established community sustainability effort, characterizes it as "long-term cultural, economic and environmental health and vitality."

These definitions strive to balance environmental, social and economic issues in all decision-making activities. With urban forests, for example, we must consider the ability of trees to absorb carbon from the air and their role in restoring beauty, economic value and recreational opportunities to city settings. Similarly, when addressing concerns about child health, we must consider children's access to affordable medical care and proper nutrition and the potential impact of pollutants and environmental toxins.

Although many projects may contribute to community sustainability, it's difficult to know which are most effective. To address this problem, Seattle and other communities nationwide have initiated efforts to measure and guide community sustainability by using indicators.

Different communities' indicators may be varied, but they are guided by a common ethic. As described by Chiras, this ethic holds that "the Earth has a limited supply of natural resources and that they're not all for human beings; humans are part of nature, not apart from it and not immune to its laws; success stems from efforts to cooperate with the forces of nature, not dominate them; and all life depends on maintaining a healthy, well-functioning ecosystem."

Community Sustainability Monitoring

Every community is complex, consisting of environmental, social and economic systems that interact with each other.

To measure sustainability with a minimum of time, money and labor, communities are using indicators. These are "bits of information that reflect the status of large systems," according to Sustainable Seattle. "They are a way of seeing the 'big picture' by looking at a smaller piece of it. They tell us which direction a system is going: up or down, forward or backward, getting better or worse, or staying the same."

A set of indicators can provide a wide range of information. For example, an emerging Portland, Ore., sustainability plan includes indicators measuring everything from the percentage of the population that performs volunteer work to gasoline consumption per person.

There are several different kinds of indicators. Some can be measured directly by using official sources, such as government data. Others are based on physical measurements citizens must perform themselves, such as data collected in stream monitoring programs. Still other indicators can be measured only through community surveys. All indicators selected for this monitoring project can be measured using official sources, such as government data.

Different cities describe their indicators in different ways. For example, Portland and Multnomah counties in Oregon have assembled a checklist of their indicators' important characteristics:

1) **Results**. Where possible, indicators should measure results (for example, adult literacy rates) rather than efforts (such as the amount of money spent on literacy education). Results measure achievement more accurately than data about programs and expenditures. By focusing on and keeping track of results, the community learns what works and adjusts its programs accordingly.

2) **Comparability**. Communities should be able to compare their indicators with one another. This requires using standard measurements and making data easy to understand.

3) **Long-range reliability**. Indicators should be reliable for up to two decades or more. This is a typical time frame for strategic planning.

4) **Accessibility**. Indicator data should be relatively easy to gather and analyze at regular intervals (a year, two years, five years).

5) **Documentation**. Indicators should come from reliable sources, such as official records or commissioned research. It is helpful to add endnotes or footnotes to indicators to give readers additional information and measurement criteria.

Most of the following 12 indicators for monitoring community sustainability come from municipal sustainability plans for Jacksonville, Fla.; Lake Tahoe, Nev.; Portland, Ore.; and Olympia and Seattle, Wash. Others come from the Minnesota Sustainable Development Initiative or were developed by the staff of the Izaak Walton League of America's Carrying Capacity Project.

Some indicators may be irrelevant for certain regions. For example, the acres of forest land indicator obviously does not apply to a desert region. Data for each indicator can be obtained from various local or federal governmental agencies and nonprofit groups, and suggestions are included about people to contact for information.

Selected Community Sustainability Indicators

- Total population with annual growth rate
- Percent of population 18 and older voting in elections
- Percent of students receiving formal environmental education
- Percent of students receiving population education
- Pounds of solid waste landfilled per capita per year
- Electricity consumption from nonrenewable sources per capita per year
- Days with the Air Quality Index (AQI) in the good range
- Acres of land available for agriculture
- Percentage of samples per year of rivers and streams meeting U.S. Environmental Protection Agency in-stream water quality standards
- Acres of natural, restored and human-created wetlands
- Acres of forestland
- Biodiversity as measured by the number of species in an annual bird count

Procedure:

1. Organize the students into 12 groups. Begin by discussing the definition of an indicator, what it indicates, and how it can be used. Define the geographic boundary of your community within which you will collect indicator data. Randomly distribute one community sustainability indicator student page to each group. Have each group work quietly to read the student page and prepare to report back to the class about why the indicator was selected by the author and how it can be measured. (Note: If class members decide an indicator cannot be measured in their community, i.e. the community is in a desert area and there are no trees, have students eliminate these indicators. Reassign students to remaining groups. Do not remove an indicator because the data point is expected to have a low value.)

2. Community sustainability indicators may be classified as economic, environmental or social. Review the definition for each classification (given below) and decide as a class how each of the selected community sustainability indicators can be classified. Explain why. Note that all the indicators are, in part, influenced by and linked to economic, environmental and social factors.

economic indicator - an indicator that measures economic vitality, diversity, security and equity

environmental indicator - an indicator that measures the ability of an ecosystem to function effectively

social indicator - an indicator that measures the effectiveness of programs that address population, civic participation, health, education and welfare

3. Have each group conduct research to determine the data point for its indicator. This may involve calling local government agencies or offices or using resources available in a local or regional library. Ask each group to report its data point to the class and provide documentation about how the data point was obtained. Have the class discuss whether or not the data point suggests that the indicator is promoting sustainability. Local experts may be consulted.

4. Create a community sustainability report card on poster board to display the class's findings.

5. Have the students write articles for the local media (newspaper, radio or television) to report their findings. Writing articles is one way to communicate with other members of your community. This exercise also can educate media representatives about monitoring efforts and the importance of the linkages among the indicators you measured. An article can encourage policy-makers to consider the environmental and social impacts of their decisions -- impacts that often are not included in traditional economic measurements. Finally, it can motivate individuals to become involved personally in community sustainability efforts.

Extensions:

1. Have student groups identify additional indicators of special importance to their community. As a guideline, use the checklist of important indicator characteristics developed by the Portland, Ore., group and described in the preceding background information. Have students explain their reasons for selecting the indicator and how it can be measured. Students then should conduct research to determine the indicator data point and document its source as in the original indicator monitoring activity. Students may report their additional findings as in the original procedure.

2. If the "Monitoring Sustainability" section is repeated in subsequent years, students may compare indicator data points and look for trends. Students should consult local experts to interpret these trends.

Resources:

"Building Sustainable Communities," 1993, pamphlet available from CONCERN Inc., 1794 Columbia Road N.W., Washington, D.C. 20009, or call (202) 328-8160.

"Defining Community Sustainability by Measuring It," by Walter Corson, 1993, article published in Community Sustainability Exchange, No. 1, 1993, available from: Community Sustainability Resource Institute, P.O. Box 11343, Takoma Park, Md. 20913, or call (301) 588-7227.

"Executive Summary: Life in Jacksonville -- Quality Indicators for Progress," 1993, booklet available from Jacksonville Community Council Inc., JEA Tower, 11th Floor, 21 West Church St., Jacksonville, Fla. 32202, or call (904) 356-0800.

"How Big is Our Ecological Footprint?" by Mathis Wackernagel, 1993, booklet available from The Task Force on Planning Healthy and Sustainable Communities, The University of British Columbia, Department of Family Planning, 5804 Fairview Ave., Vancouver, BC, Canada V6T 1Z3, or call (604) 822-4366.

"Indicators of Sustainable Community," 1993, pamphlet available from Sustainable Seattle, c/o Metrocenter YMCA, 909 Fourth Ave., Seattle, Wash. 98104, or call (206) 382-5013.

"Making Arlington County, Virginia, a Sustainable Community," by Martin Ogle, 1994, pamphlet available from Arlington Community Sustainability Network, 3308 South Stafford St., Arlington, Va. 22206, or call (703) 358-6427.

"Minnesota Milestones: 1993 Progress Report," 1993, booklet available from Minnesota Planning, 658 Cedar St., St. Paul, Minn. 55155, or call (612) 296-3985.

"Portland-Multnomah County Benchmarks: Standards for Measuring Community Progress and Government Performance," 1994, booklet available from the Portland-Multnomah County Progress Board, 1120 S.W. Fifth Ave., Rm. 1250, Portland, Ore. 97204, or call (503) 823-6990.

"State of the Community," 1993, booklet available from Olympia Roundtable, 2129 Bethel St. N.E., Olympia, Wash. 98506, or call (206) 754-7842.

Community Sustainability Indicators

Total population with annual growth rate

Reasons for selection

Every part of the environment — water, air, soil — is impacted by growing numbers of people and their activities. Population growth has fueled urban and suburban sprawl that has replaced large areas of woods, grasslands, farm fields and wetlands. These natural spaces are critical to maintaining the land's carrying capacity and providing vital resources such as clean air, clean water and food to human and wildlife populations.

How to measure

Official population measurements for 1970, 1980 and 1990 can be obtained from U.S. Census Bureau publications, which are available in most large libraries. Most municipal or county agencies will have estimated population numbers and growth rates for the years in between. The Population Reference Bureau, a nonprofit group located in Washington, D.C., also maintains a wide range of population information. The bureau may be contacted at 1875 Connecticut Ave. N.W., Suite 520, Washington, D.C. 20009-5728, by calling (202) 483-1100, or via the Internet at http://www.prb.org/prb/

Documentation

Data source

organization/agency:

contact name:

phone number:

Data collection method

___ direct measurements
___ projections based on samples
___ forms or reports sent in by others
___ other _____

Data details

Are these data available in published reports? Title(s)?

How accurate are the data? Explain your answer.

How long has the organization or agency collected the data?

How often are the data collected?

Data point

Total population with annual growth rate:

Community Sustainability Indicators

Percent of population 18 and older voting in elections

Reasons for selection

Voter turnout measures the extent to which people can and do participate in the democratic process.

In a sustainable society, all citizens should desire and have the opportunity to participate fully in decisions about the way their community is governed. Consistently high voter turnout rates indicate that citizens are engaged actively in the democratic process. A low or decreasing turnout can indicate public cynicism, disenfranchised segments of society, or a government out of touch with voters.

How to measure

Collect data about elections that are relevant to community issues and are not significantly influenced by factors beyond the community's control (the national economy or international issues, for example). Data about these elections can be obtained from the board of elections in your community. If you do not have such a board, contact the information desk at your local library for further assistance.

Documentation

Data source
organization/agency:

contact name:

phone number:

Data collection method
___ direct measurements
___ projections based on samples
___ forms or reports sent in by others
___ other _____

Data details
Are these data available in published reports? Title(s)?

How accurate are the data? Explain your answer.

How long has the organization or agency collected the data?

How often are the data collected?

Data point

Percent of population 18 and older voting in elections:

Community Sustainability Indicators

Percent of students receiving formal environmental education

Reasons for selection

Formal environmental education helps students make difficult decisions about their lifestyles. It also prepares them to understand environmental laws and the importance of electing political candidates who share their environmental views. Environmental education may further motivate students to participate in environmental and conservation organizations and to pursue professional careers in environmental fields. An environmentally literate society is better prepared to make the long-term decisions sustainability requires.

How to measure

Your local school board will have this information. It probably will be categorized under science education.

Documentation

Data source
organization/agency:

contact name:

phone number:

Data collection method
___ direct measurements
___ projections based on samples
___ forms or reports sent in by others
___ other _____

Data details
Are these data available in published reports? Title(s)?

How accurate are the data? Explain your answer.

How long has the organization or agency collected the data?

How often are the data collected?

Data point

Percent of students receiving formal environmental education:

Community Sustainability Indicators

Percent of students receiving population education

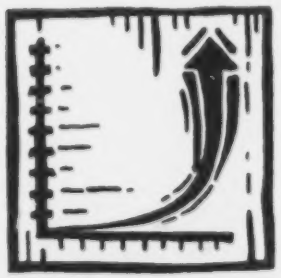
Reasons for selection

Population education is the study of human numbers, their distribution and their impact on social and natural environments. Students who receive population education may make more informed choices regarding family size and land planning and have a better understanding of the global impacts of continued population growth.

Taught from a local perspective, population education demonstrates how local population and natural resource consumption affect specific regions, states, counties and -- most importantly -- individual communities or towns.

How to measure

Call your local school board. Population issues probably will be taught as part of social studies or environmental science. However, population education is not widespread, so it may not be part of your school's curriculum.



Documentation

Data source
organization/agency:

contact name:

phone number:

Data collection method
___ direct measurements
___ projections based on samples
___ forms or reports sent in by others
___ other _____

Data details
Are these data available in published reports? Title(s)?

How accurate are the data? Explain your answer.

How long has the organization or agency collected the data?

How often are the data collected?

Data point

Percent of students receiving population education:

Community Sustainability Indicators

Pounds of solid waste landfilled per capita per year

Reasons for selection

Although the amount of solid waste generated is an important indicator of sustainability, the amount of waste landfilled is the true measure of resource consumption. We landfill what we cannot or will not recycle.

Landfills ultimately are hazardous to the environment. They can vent dangerous gases into the air and leak pollutants into the water table, contaminating adjacent soil and nearby waterways.

How to Measure

Call your local environmental protection office or department. Also, county or municipal offices of waste management will have these data.

Documentation

Data source

organization/agency:

contact name:

phone number:

Data collection method

___ direct measurements
___ projections based on samples
___ forms or reports sent in by others
___ other _____

Data details

Are these data available in published reports? Title(s)?

How accurate are the data? Explain your answer.

How long has the organization or agency collected the data?

How often are the data collected?

Data point

Pounds of solid waste landfilled per capita per year:

Community Sustainability Indicators

Electricity consumption from nonrenewable sources per capita per year

Reasons for selection

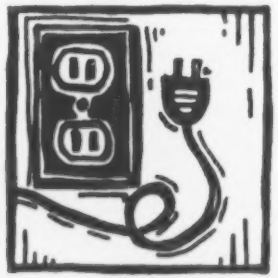
Fossil fuels — coal and oil — represent nonrenewable, one-time supplies of energy. Since the Industrial Revolution — and increasingly in recent years — we've used these resources at very high levels without regard for future generations' energy needs.

The extraction, transportation, refining and burning of fossil fuels cause many of our most serious environmental problems. The use of these nonrenewable resources contaminates the environment with pollutants such as carbon monoxide, sulfur dioxide, and mercury and other heavy metals. Burning fossil fuels also releases carbon dioxide and other gases that could alter the Earth's climate.

Community sustainability requires that we reduce nonrenewable energy use in favor of renewable energy supplied by solar power, wind power and some hydroelectric designs.

How to measure

Contact your local power company for information about per-capita consumption of electricity generated from nonrenewable sources.



Documentation

Data source
organization/agency:

contact name:

phone number:

Data collection method
___ direct measurements
___ projections based on samples
___ forms or reports sent in by others
___ other _____

Data details
Are these data available in published reports? Title(s)?

How accurate are the data? Explain your answer.

How long has the organization or agency collected the data?

How often are the data collected?

Data point

Electricity consumption from nonrenewable sources per capita per year:

Community Sustainability Indicators

Days in the past year with Air Quality Index (AQI) in the good range

Reasons for selection

The Air Quality Index is a measurement of certain key pollutants — including carbon monoxide, sulfur dioxide and ozone — in the atmosphere. A good air quality rating is issued only when all these key pollutants are present in levels that are thought to have no effect on human health.

Both natural and human-created environments are affected strongly by air pollution. For example, acid precipitation makes forests more susceptible to disease and pests, alters the chemistry of aquatic ecosystems, and damages the masonry of many buildings and national landmarks. Also, air pollutants disproportionately can affect the health of certain people, such as children, the elderly and people with respiratory ailments.

Air pollution has strong economic repercussions. Regions that consistently fail to meet air quality standards can be denied federal government funding for projects such as highways and other transportation systems. In addition, industrial and other business development can be held up until a region meets the set standards. High pollution levels can reduce agricultural productivity and limit the economic potential of many other resources, including forests, marine and freshwater fisheries, and nature-based tourism.

How to measure

Air quality generally is monitored by a local air pollution control board or by other government agencies. Often, the daily Air Quality Index rating is given during local telephone and television weather reports.

Documentation

Data source
organization/agency:

contact name:

phone number:

Data collection method
___ direct measurements
___ projections based on samples
___ forms or reports sent in by others
___ other _____

Data details
Are these data available in published reports? Title(s)?

How accurate are the data? Explain your answer.

How long has the organization or agency collected the data?

How often are the data collected?

Data point

Days in the past year with Air Quality Index (AQI) in the good range:

Community Sustainability Indicators

Acres of land available for agriculture

Reasons for selection

Fertile agricultural soils are essential for food production. As populations grow, more and more land area is needed to expand housing, roadways and commercial enterprises. However, the most desirable land for these activities is often the most desirable land for agriculture because it is generally level and well drained, but undeveloped.

The amount of available agricultural land is linked to the local economy, the quality of foods available to local consumers, and the preservation of open space. In addition, when a community's food comes mainly from local sources, transcontinental and international transportation of food is reduced. Food produced in the local area keeps money circulating in the local economy. People also may have more information about or influence over the methods used to produce the foods they purchase locally.

Agricultural fields provide open space and habitat for wildlife. For example, many wildlife species benefit from gleaning waste grain, and they seek shelter in winter field stubble.

How to measure

Data can be obtained from several sources. First, many states and counties have offices of the Natural Resource Conservation Service (formerly called the Soil Conservation Service). Soil uses are cataloged as part of these offices' mapping processes. In addition, many states now have Geographic Information Systems (GIS). These computerized systems use satellite images to provide information to planners and scientists about roads, waterways, forests and agricultural land.

Documentation

Data source

organization/agency:

contact name:

phone number:

Data collection method

___ direct measurements

___ projections based on samples

___ forms or reports sent in by others

___ other _____

Data details

Are these data available in published reports? Title(s)?

How accurate are the data? Explain your answer.

How long has the organization or agency collected the data?

How often are the data collected?

Data point

Acres of land available for agriculture:

Community Sustainability Indicators

Percentage of samples per year of rivers and streams meeting U.S. EPA in-stream water quality standards

Reasons for selection

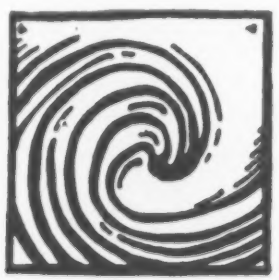
Human activities generate pollutants, many of which end up in surface waters. As human populations and pollution grow, the amount of clean water available to humans, wildlife and plants may well diminish.

Water is a renewable resource, but its availability to future generations depends on present efforts to eliminate pollution and restore degraded waterways.

How to measure

In-stream water quality standards are determined by environmental agencies, such as state departments of natural resources or departments of fish and game, in compliance with federal Environmental Protection Agency guidelines.

If your community is located near a major river, bay or coastal waterway, water quality may be monitored regularly by state water quality boards or a local university or research institute. Local governments also may test regional waterways, such as creeks and streams. In addition, many community members monitor water quality themselves through programs such as the Izaak Walton League of America's Save Our Streams (SOS) Program.



Documentation

Data source
organization/agency:

contact name:

phone number:

Data collection method
___ direct measurements
___ projections based on samples
___ forms or reports sent in by others
___ other _____

Data details
Are these data available in published reports? Title(s)?

How accurate are the data? Explain your answer.

How long has the organization or agency collected the data?

How often are the data collected?

Data point

Percentage of samples per year of rivers and streams meeting U.S. Environmental Protection Agency in-stream water quality standards:

Community Sustainability Indicators

Acres of natural, restored and human-created wetlands

Reasons for selection

Wetlands are among the most critical elements of a healthy ecosystem. They provide buffers between human development and aquatic ecosystems, filtering toxins and sediments that run off our yards, parking lots, roadways and agricultural fields.

Freshwater wetlands also serve as recharge sites for freshwater aquifers. Furthermore, wetlands provide economic returns, serving as nursery grounds for many species of sport and commercially harvested fish and for trees with high value as timber. Wetlands also are home to more than half of all species currently listed by the federal government as threatened or endangered.

How to measure

Data are available from several sources. First, many states and counties have Natural Resource Conservation Service offices that catalog soils through a soil mapping process. In addition, many states now are using Geographic Information Systems (GIS), which collect data about many different land types, including wetlands. Also, if you live in a state that has a large number of wetland acres, there may be a wetlands office within your state department of natural resources. This office can provide you with all the data you need.

Documentation

Data source
organization/agency:

contact name:

phone number:

Data collection method
___ direct measurements
___ projections based on samples
___ forms or reports sent in by others
___ other _____

Data details
Are these data available in published reports? Title(s)?

How accurate are the data? Explain your answer.

How long has the organization or agency collected the data?

How often are the data collected?

Data point

Acres of natural, restored and human-created wetlands:

Community Sustainability Indicators

Acres of forestland

Reasons for selection

Forests prevent erosion, purify and retain underground water, and remove large amounts of carbon dioxide from the atmosphere. If sustainability guides management practices, forests can provide the resources necessary for a sound community economy. Forests also serve as vital habitat for thousands of wildlife and plant species, and they offer recreational opportunities, including hiking, hunting, photography and birding.

How to measure

Data about forestland should be available from the U.S. Forest Service office in your county or state. If your locale is not served by a Forest Service office, try to access data through an office or agency that uses the Geographic Information System (GIS). GIS uses satellite images to provide information to planners and scientists about numerous environmental conditions. Various government offices, including the Forest Service, can refer you to offices or agencies that use GIS.

Documentation

Data source
organization/agency:

contact name:

phone number:

Data collection method
___ direct measurements
___ projections based on samples
___ forms or reports sent in by others
___ other _____

Data details
Are these data available in published reports? Title(s)?

How accurate are the data? Explain your answer.

How long has the organization or agency collected the data?

How often are the data collected?

Data Point

Acres of forestland:

Community Sustainability Indicators

Biodiversity as measured by the number of species in an annual bird count

Reasons for selection

Biodiversity, as measured by bird species, is linked to habitat diversity and water and air quality. Birds and the foods they eat are sensitive to water and air pollution. Many birds are habitat specific — they need certain habitats, such as old growth forests, wetlands and grasslands, for which there are no substitutes. The loss of these habitat types results in the decline or extermination of certain bird species. Also, bird-watching and related tourism activities have important economic benefits.

Bird populations also are linked to international human population pressures. Because birds are migratory, they depend on international destinations for winter habitat. Population pressures in these areas may destroy forests that provide winter habitat. Birds then lose their homes, and their numbers decline.

How to measure

Bird counts are taken annually by a number of national and local ornithological institutions. The National Audubon Society conducts annual winter bird counts that use standardized methods. State ornithological societies may collect similar data but for different seasons, such as migratory spring bird counts or summer breeding bird surveys. National Audubon Society bird count data are published in its journal, American Birds, or available via the Internet at http://www.im.nbs.gov/bbs/introcbc.html

Documentation

Data source
organization/agency:

contact name:

phone number:

Data collection method
___ direct measurements
___ projections based on samples
___ forms or reports sent in by others
___ other _____

Data details
Are these data available in published reports? Title(s)?

How accurate are the data? Explain your answer.

How long has the organization or agency collected the data?

How often are the data collected?

Data point

Biodiversity as measured by the number of species in an annual bird count:

SUSTAINABILITY SERVICE PROJECTS

SUSTAINABILITY SERVICE PROJECTS

Subjects:
business education, environmental science, family studies, foreign language, health, language arts, math, music, social science, technology education, visual arts and vocational education, among others

Vocabulary:
service learning

Objective:
Students will become involved in working toward community sustainability and will increase their ability to plan and complete a project outside the school setting.

Method:
Students will identify, plan, implement, evaluate and reflect on a community-based service project that promotes community sustainability.

Materials:
student pages (Service Project Proposal and Self-Evaluation), pencil, paper and other supplies

Background:
Service learning is defined by the Maryland State Department of Education as "making a difference through actions of caring by personal contact, either in the school or the community, with preparation and reflection." Although service learning is similar to traditional school-based activities like community service and volunteerism, it is unique in that it links these efforts with academic learning.

Through service learning, students gain a greater awareness of how they can become involved actively in improving their schools and communities. Participation in community activities and decision making are central to community sustainability. However, many citizens lack the practical experience of working with community members outside their home or workplace.

Service learning prepares students to work collaboratively as part of a team, to assume a broad range of roles and responsibilities within a group, and to take pride in group and individual accomplishment. It prepares students to organize people to get a job done and to value working with others. Students gain an appreciation of the duties and privileges of citizenship and an understanding of the political process. They learn how to articulate concerns about a problem and how to develop creative solutions. They learn the benefits of perseverance and working with a variety of people. Service learning provides an opportunity to explore the concept of service and develop interpersonal and communication skills.

Service learning also helps students learn about and work to solve issues related to community sustainability. These issues may be largely environmental, social or economic, or they may be a balanced blend of two or more of these. There are many different kinds of projects students can undertake to promote sustainability. Projects that reduce our use of natural resources or improve the environment, projects that assist disenfranchised members of our community or work to correct an injustice, or projects that encourage "green" businesses are among the many possibilities.

Service learning projects develop critical leadership skills. Accordingly, care should be taken to ensure that students select projects appropriate to their leadership skill level — projects that challenge but provide realistic opportunities for success. Here are just a few ideas for community sustainability service learning projects. They are listed by leadership level.

Intermediate Leadership - requires some direct supervision but provides opportunities for independent judgment
- Contact a local environmental organization or social services agency and participate in one of its projects. For example, students can work with local agencies to plant trees in local parks, schools or other public places.

Experienced Leadership - requires little direct supervision and provides more opportunities for independent judgment
- Improve energy use efficiency. Learn to weather-strip doors and windows. Check several homes and weather-strip them.
- Conduct a creek clean-up and recycle recovered materials.
- Start a community sustainability column in your school newspaper.
- Translate a brochure about a community sustainability topic into another language spoken in your community.

Advanced Leadership - provides many opportunities for independent judgment as well as some advisory and supervisory responsibilities
- Study a community sustainability issue. Prepare and teach lessons to classes of younger students.

- Prepare and distribute a handbook of small-scale business services, such as sewing, word processing and pet care, that are offered by community members.
- Arrange for public officials to discuss community sustainability issues, such as land planning, transportation or energy use during your social studies class.
- Organize a "Careers for Community Sustainability" day with guest speakers.
- Conduct a school-based sustainability audit. Look at energy use, waste management, landscape maintenance, storm water management, etc.

Procedure:

1. Have students reflect on what they have learned in the first five sections of this mini-curriculum. What is community sustainability, and how can it benefit me and my community? How do social, environmental and economic factors affect activities in my community? Are there special characteristics that are worth restoring or preserving in my community? What is my vision of life in my community in the future? Have indicators identified priority issues that should be addressed in my community? How can I get involved in promoting sustainability in my community?

2. Decide whether the entire class will design and undertake a single project or if students will work in small groups and complete several projects. Once this is determined, begin the task of identifying a potential project or projects.

3. Have the class or student groups complete the Community Sustainability Service Project Proposal student page.

Students should keep the following tips in mind when selecting a project and developing proposals:

- Make sure the projects are interesting and that the activities provide a service the community needs.
- Plan the projects carefully and realistically.
- Be willing to make commitments and keep them.
- Be prepared to turn problems into learning opportunities if the projects don't go exactly as planned.
- Identify other community groups that already may be conducting similar projects and pursue opportunities for collaboration, if appropriate.
- Remember that if the projects require money, grant writing or other fund-raising efforts will be necessary.

4. Review the project proposal(s). If students are working in small groups, ask them to present their proposals to the class. Other students or student groups should be encouraged to make suggestions about how to strengthen the projects.

5. Students should make any needed revisions to their proposals and conduct any necessary pre-project research. Students should construct a time line for implementing the project and identify deadlines for: 1) first written progress reports and presentations; 2) second written progress reports and presentations; 3) actual project completion; 4) completed written project evaluation and presentations; 5)completed, written self-evaluation; and 6) optional follow-up presentations, writing projects, posters, etc. Post these deadlines in a prominent place in the classroom.

6. Students should give short progress report presentations to the class on designated days. The class should be encouraged to support and give helpful suggestions to the project team(s). The team(s) should solicit suggestions from the class for solving problems. Written progress reports may be accompanied by pictures, slides, videotape and/or computer graphics. Display written progress reports near the posted deadlines.

7. Students should use the guidelines they designed in the proposal to prepare a project evaluation and present it to the class on a designated day. Written project evaluations may be accompanied by pictures, slides, videotape and/or computer graphics. Display the written project evaluations with the progress reports.

8. Students individually should complete a Self-Evaluation student page. You also may choose to have the students write a lessstructured self-evaluation.

9. Suggestions for follow-up are included in the extensions listed below.

Extensions:

1. Have students design posters about their community sustainability service projects. Have students use the posters to make presentations about their projects to: 1) other students in their grade or other grades, 2) studentsin other schools, 3) their city or town council, or 4) other community groups or organizations.

2. Have students write articles about their community sustainability service projects. Have them submit the articles to the school newspaper, local newspapers or local government officials.

3. Have students write about additionalsteps they could take to promote community sustainability.

Resources:

"High School Service Learning Curriculum," 1994, available from the Maryland Student Service Alliance, 200 West Baltimore St., Baltimore, Md. 21201, or call (410) 767-0358.

"Learning by Serving: 2,000 Ideas for Service-Learning Projects," 1994, available from SouthEastern Regional Vision for Education, Route 1, Box 8500, 3841 Reid St., Palatka, Fla. 32177.

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COMMUNITY SUSTAINABILITY SERVICE PROJECT
PROPOSAL

NAMES OF GROUP MEMBERS:

PROJECT TITLE:

1. State your goal. What do you hope to accomplish by conducting this project? How will it help the community? Who will benefit from your project? Be specific.

2. In addition to providing benefits to the community, what do you expect to learn from your project?

3. What steps will you take to reach your goal? Be specific.

1.

2.

3.

4.

5.

4. What problems do you anticipate?

5. What resources will you need (people, money, etc.)?

6. Where could you get these resources?

7. Are there any other organizations or institutions conducting similar projects? Who are they? How can you help them? How can they help you? Be specific.

8. How will you evaluate your project? How will you know you have reached your goal?

TIME LINE

Start Project: _____

First Progress Report: _____

Second Progress Report: _____

Complete Project: _____

Project Evaluation: _____

COMMUNITY SUSTAINABILITY SERVICE PROJECT
SELF-EVALUATION

1. Briefly describe your project.

2. What was the main goal of this project?

3. Did you accomplish the main goal? If so, what were the keys to that success? If not, what prevented you from attaining the goal?

4. What problems did you encounter? What did you learn from them?

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5. Do you believe your project helped advance community sustainability? Discuss your answer.

6. Discuss how this project will affect you in the future, if at all.

7. Discuss the following statements:

a. Adults make the decisions about what happens in my community, so they should be responsible for making it a better place to live.

b. It's not my job. Let someone else do it.

c. Living sustainably means finding ways to meet the needs of everyone in our community while respecting the rights of future generations to meet their own needs.

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INFORMATION TECHNOLOGY CONNECTIONS

INFORMATION TECHNOLOGY CONNECTIONS

This section has been written for educators with a working knowledge of Internet and its related information technologies.

The fields of community sustainability and environmental education for sustainability emerged in the early 1990s. Today, research about these topics continues, and new information about sustainability is becoming available on a daily basis. One way to learn about ongoing community sustainability projects and to find out about the results of current research is through equally new information technologies, like the Internet.

Many organizations engaged in community sustainability or the broader field of sustainable development post their information on the Internet. Some of this information is intended for planners and architects, some is for policy-makers, and some is for community advocates. Much of this information may be useful to students conducting research about the complex mix of economic, social and environmental issues that influence sustainability.

Information may be obtained through a variety of Internet services. Electronic mail (e-mail) allows students to exchange messages with anyone around the globe -- often for the cost of a local telephone call. It is a personal type of communication that requires the sender to know the e-mail address of the receiver. An Internet e-mail address is displayed in the form "user *@* system."

"Listservers" are mailing lists of individuals who are interested in a common topic. This is a helpful avenue for people searching for collaborators and colleagues. Internet users can add or remove themselves from a list by sending an e-mail message to the listserver.

Internet "gophers" provide access to information and resources such as data bases accessible to the "gopher site." Many colleges, universities and university systems maintain gopher sites. Gopher sites have search tools like "Veronica" that can be used to search for items, accessible to the gopher, that match key words like sustainability.

An Internet feature called "Telnet" allows students to visit any Internet-accessible private or public computer. For example, Telnet may be used to access a local library's electronic card catalog.

Internet "Relay Chats" allow students to exchange information with other students and researchers in real time.

The "World Wide Web" (WWW) is a collection of individual information sources linked by "hypertext." Hypertext is a word or graphic image that when selected allows the user to move from information source to information source. Electronic resource searches also may be conducted on the WWW using services with product names like "AltaVista."

Prior to using these services, students should be provided with a set of guidelines for the Internet. Educators also should specify consequences for abuse of Internet privileges. Student contracts for Internet use commonly are developed to emphasize the importance of using the Internet solely to complete appropriate research and communication tasks.

The role of educators, assisting students with Internet resources, is to help students find data sources, understand data, use data, communicate their ideas and findings with others, and to help them evaluate their ideas and findings based on the input of others. A key step in this process is encouraging students to assess critically the information they find and helping them evaluate the scientific merits of the information. Some questions students may ask to help analyze the information they obtain are:

- Does the information represent someone's opinion or is it supported by scientific evidence?
- Does the information come from a recognized expert or authority on the topic? Does the author have professional training in the area about which they are writing? Does the author have scientific evidence to support his or her opinion?
- Does the information promote a particular point of view that is not completely supported by scientific evidence?
- Does other scientific evidence exist that contradicts the author's or authors' claims?
- Is there an alternative impartial source for the information?

WORLD WIDE WEB SEARCH TOOLS

The following is a list of some of the World Wide Web's search tools. By using key words or phrases, student researchers can navigate through the WWW in search of information.

The search tool name (in bold), its URL (uniform resource locator or its Internet address) and its provider are included in each listing.

This list is not exhaustive, but is meant to provide a starting point for research. Inclusion does not constitute an endorsement by the Izaak Walton League of America or the authors of this mini-curriculum.

AltaVista
http://www.altavista.digital.com/
This search tool is a product of Digital Equipment Corp.

InfoSeek
http://www2.infoseek.com/
This search tool is a product of InfoSeek Corp.

Inktomi
http://inktomi.berkeley.edu/
This search tool is a product of the University of California at Berkeley.

Lycos Inc.
http://lycos.cs.cmu.edu/
This search tool is a product of Carnegie Mellon University.

MetaCrawler
http://metacrawler.cs.washington.edu:8080/
This is a collection of eight different search tools. It is a product of Eric Selberg and Oren Etzioni.

NIH
http://www.alw.nih.gov/WWW/searches.html
This is a collection of search tools, including several in this listing. It is a product of the National Institutes of Health.

WebCrawler
http://webcrawler.com/
This search tool is a product of America Online.

Yahoo
http://www.yahoo.com/
This search tool is a product of the Yahoo Corp.

WORLD WIDE WEB SERVERS

The following listing of World Wide Web servers was compiled using a standard resource search. These are sites that provide access to information and hypertext links that allow users to browse pathways of specific interest. There is no guarantee that the information listed here will be available to everyone, or that it will not have been removed by its owner. The opinions expressed are those of the resources' authors. This is not a comprehensive list of sustainability sites on the Internet but is a brief introduction designed to provide a starting point that may lead students and teachers to a broad range of resources and information.

The resource name (in bold), its URL and a brief description of the kind of information it contains are included in each listing.

Chattanooga
http://www.chattanooga.net/SUSTAIN/index.html
Chattanooga was created by Chattanooga Community Link, a group seeking to facilitate electronic access for civic and community functions. Its mission is to share information about sustainable technology and development, both locally and globally. The participants in this forum believe that responsible use of natural resources locally can produce global results.

Earth Council
http://terra.ecouncil.ac.cr
The Earth Council is an international nongovernmental organization started in November 1993 as a direct result of the Earth Summit. It provides information about sustainable development around the world.

EcoNet
http://www.econet.apc.org
EcoNet provides a large network of resources on a wide range of environmental topics. Information about sustainability and population is available through the EcoNet Resource Center.

EE Link
http://nceet.snre.umich.edu
EE Link is a maintained by the University of Michigan, a partner in the Environmental Education Training Project of the North American Association for Environmental Education. It provides a diverse range of educator resources including classroom resources, contacts, reference information, regional news and a directory.

EnviroLink Network
http://www.envirolink.org
EnviroLink Network is a nonprofit organization that provides on-line environmental information. It provides links to Green Marketplace and the Sustainable Earth Electronic Library.

IISDnet
http://iisd1.iisd.ca/
IISDnet provides timely information about sustainable development research, planning and action around the world. It includes global news about sustainable development and information about sustainability indicators and government policy.

Linkages
http://www.mbnet.mb.ca/linkages
Linkages is a multimedia resource provided by the International Institute for Sustainable Development (IISD), an independent Canadian research institute. This site is a clearinghouse for information on past and upcoming international meetings related to the environment and development. It serves as a hub for sustainable development issues.

PopClock
http://www.census.gov
The U.S. Census Bureau provides access to current population information for the United States and the world.

Population Reference Bureau
http://www.prb.org/prb/
The Population Reference Bureau provides timely, objective information about United States and world human population trends.

Solstice
http://solstice.crest.org/
Solstice is the Internet information service of the Center for Renewable Energy and Sustainable Technology. It provides information about energy efficiency, renewable energy and sustainable living.

United Nations Development Programme
http://www.undp.org/
The United Nations Development Programme site is a gateway to resources provided by the United Nations. It has links to the United Nations Environment Programme (UNEP), Population Information Network (POPIN) and search engines for other WWW sites.

United States Environmental Protection Agency
http://www.epa.gov
The U.S. Environmental Protection Agency maintains a searchable data base that covers a wide range of environmental topics in its on-line library system.

Youth Sourcebook on Sustainable Development
http://iisd1.iisd.ca/youth/ysbk000.htm
The Youth Sourcebook on Sustainable Development contains information on youths' concerns about sustainable development issues and case studies of youth action. It also provides advice about how to organize for action, useful resource lists and a directory of international and regional youth organizations.

BULLETIN BOARD LISTSERVERS

The following is a short list of bulletin board listservers. These are mailing lists of individuals who are interested in a common topic. To join a list, send an e-mail message to the listserver address. In the body of the message type "subscribe *list name your name*." To remove your name from a list, send a message to the listserver stating "unsubscribe *list name your name*."

The listserver name (in bold), its e-mail address and a brief description of the topics it covers and the intended audience are included for each listing.

As in the other lists, this listing of bulletin board listservers is neither complete nor endorsed by the Izaak Walton League of America or the authors of this mini-curriculum. The opinions expressed are those of the listserve subscribers.

ENVST-L (Environmental Studies Discussion List)
listserv@brown.brown.edu
This is a moderately active group that discusses a variety of environmental issues often related to education and teaching.

Kidsphere
kidsphere-request@vms.cis.pitt.edu
This is a very active group of educators who discuss and share information about student projects.

eco-curriculum
listproc@envirolink.org
This list is supported by the Envirolink Network. Its purpose is to discuss environmental education.

RESOURCES

"Internet Activities Using Scientific Data: A Self-Guided Exploration," by Stan Froseth and Barbara Poppe, 1995, available from the U.S. Government Printing Office, Washington, D.C. 20402.

"Internet for Dummies," by John R. Levine and Carol Baroudi, 1993, published by IDG Books Worldwide, Inc., San Mateo, Calif.

APPENDIXES

GLOSSARY

carrying capacity: the maximum number of organisms, such as people, that a certain area of land or water can support forever without being degraded

consensus: an agreement among people

demographics: statistical data about the distribution and characteristics of a population

economic development: the generation of financial wealth and employment using a certain area's human and/or natural resources

economy: the management of a community's production, distribution and use of financial wealth and natural resources

environment: all of the external conditions, including ecological, social and economic forces, that shape the life of a person or a population

environmental justice: the act of making decisions that have just and equitable environmental, economic and social consequences

human resources: people's knowledge, creativity and labor, which can be used to make or do something useful

indicator: a data point or measurement that suggests certain environmental, economic or social conditions

integration: the act of viewing discrete environmental, economic and social factors as part of a whole

monitor: the act of observing, measuring and recording features of environmental, economic and social systems

natural resources: materials supplied by nature, such as coal, oil, minerals, water, soil, and trees, that can be used to make or do something useful

per capita: for each person

scenario: a plan detailing an imagined series of events

service learning: an endeavor that combines academic learning and volunteer help to address a community need

society: an organized group of people living together as members of a community

stewardship: responsibility for the management of environmental, economic and social factors

sustainability: the goal of a system of development that meets the basic needs of all people without compromising the ability of future generations to meet their own life-sustaining needs

sustainable development: a method of generating wealth and employment using human and/or natural resources in a certain area without compromising the ability of future generations to meet their own life-sustaining needs

technology: the application of scientific information to achieve a practical end

transformation: a change from one set of environmental, economic and/or social conditions to another

visioning: the act of imagining and describing something that may occur

COMMUNITY SUSTAINABILITY DIRECTORY

The following directory is a partial listing of private organizations and government initiatives that promote community sustainability across the United States.

Alliance for Community Education, 5103 N. Crain Highway, Bowie, Md. 20715, (410) 741-0125.

Anchorage Green Star Program, Alaska Department of Environmental Conservation, 3601 C St., Suite 1334, Anchorage, Alaska, 99503, (907) 563-6529.

Annapolis Alliance for Sustainable Communities, 5103 N. Crain Highway, Bowie, Md. 20715, (410) 741-0125.

Appalachia Science in the Public Interest, Route 5, Box 423, Livingston, Ky. 40445, (606) 453-2105.

Applegate Partnership, P.O. Box 3213, Ashland, Ore. 97520, (503) 482-6031.

Appropriate Technology Transfer for Rural Areas, P.O. Box 3657, Fayetteville, Ark. 72702, 1-800-346-9140.

Arlington Community Sustainability Network, 2860 Marcey Road, Arlington, Va. 22207, (703) 528-5406.

Cape Cod Center for the Environment and a Sustainable Economy, P.O. Box 130, Hyannis, Mass. 02601, (508) 394-2863.

Center for Energy Research/Education/Service, Ball State University, 2000 W. University Ave., Muncie, Ind. 47306, (317) 285-1135.

Center for Neighborhood Technology, 2125 W. North Ave., Chicago, Ill. 60647, (312) 278-4800.

Center for Policy Alternatives, 1875 Connecticut Ave. N.W., Suite 710, Washington, D.C. 20009, (202) 387-6030.

Center for Rural Pennsylvania, 212 Locust St., Suite 604, Harrisburg, Pa. 17101, (717) 787-9555.

Center for Sustainable Church Life, 1820 Sanford Road, Wheaton, Md. 20902, (301) 593-4724.

Center for Sustainable Cities, College of Architecture, University of Kentucky, Lexington, Ky. 40506, (606) 257-7617.

Center for Sustainable Living, Route 1, Box 107, Shenandoah Junction, W.Va. 25442, (304) 876-0740.

Center for Urban Community Development, University of Wisconsin, 929 Sixth St., Milwaukee, Wis. 53203, (414) 227-3270.

Central Virginia Sustainability Council, 413 E. Market St., Suite 102, Charlottesville, Va. 22901, (804) 972-1720.

Cerro Gordo Town Forum, Box 569, Cottage Grove, Ore. 97424, (503) 942-7720.

Chattanooga Venture, 506 Broad St., Chattanooga, Tenn. 37402, (615) 267-8687.

City of Portland Energy Office, 1030 Portland Building, 1120 S.W. Fifth St., Portland, Ore. 97204, (503) 796-7418.

City of San Francisco Bureau of Energy Conservation, Public Utilities Commission, 110 McAllister, Room 402, San Francisco, Calif. 94102, (415) 864-6915.

City of San Jose Office of Environmental Management, 777 N. First St., San Jose, Calif. 95112, (408) 277-5533.

Citizen's Network for Sustainable Development, 73 Spring St., #206, New York, N.Y. 10012, (212) 431-3922.

Citizen Planners Project of Ventura County, 99 Springdale Court, Thousand Oaks, Calif. 91360, (805) 492-0811.

Community Economic and Ecological Development Institute, 1807 Second St., #2, Sante Fe, N.M. 87501.

Community Environmental Council, Gildea Resource Center, 930 Miramonte Drive, Santa Barbara, Calif. 93109, (805) 963-0583.

Community & Environmental Defense Services, P.O. Box 206, Maryland Line, Md. 21105, (410) 329-8194.

Community Partnership Network, 500 E. Pike, Seattle, Wash. 98122, (206) 329-2919.

Community Sustainability Resource Institute, P.O. Box 11343, Takoma Park, Md. 20931, (301) 588-7227.

Concern Inc., 1794 Columbia Road N.W., Washington, D.C. 20009, (202) 328-8160.

Consortium for Regional Sustainability, Tufts University Center for Environmental Management, Curtis Hall, 474 Boston Ave., Medford, Mass. 02155, (617) 627-3486.

Context Institute, P.O. Box 11470, Bainbridge Island, Wash. 98110, (202) 842-0216.

Countryside Institute, 2231 Broadway, Suite 15, New York, N.Y. 10024, (212) 769-4580.

East Tennessee Community Design Center, 1522 Highland Ave., Knoxville, Tenn. 37916, (615) 525-9945.

Ecocity Builders, 5427 Telegraph Ave., W2, Oakland, Calif. 94609, (510) 649-1817.

Ecocity Cleveland, 3145 Berkshire Road, Cleveland Heights, Ohio, 44118, (216) 321-6478.

Ecohome Network, 4344 Russell Ave., Los Angeles, Calif. 90027, (213) 662-5207.

Ecological Life Systems Institute, 2923 E. Spruce St., San Diego, Calif. 92104, (619) 281-1447.

Ecovillage at Ithaca, Cornell University, Anabel Taylor Hall, Ithaca, N.Y. 14853, (607) 255-8276.

Environmental Awareness Center, University of Wisconsin, 1645 Linden Dr., Madison, Wis. 53706, (608) 263-2808.

Environmental Education Foundation of Florida, 215 South Monroe St., Suite 830, Tallahassee, Fla. 32301, (904) 224-8950.

Eos Institute, 1550 Bayside Drive, Corona del Mar, Calif. 92625, (714) 497-1896.

Environmental Law Institute, 1616 P St. N.W., Suite 200, Washington, D.C. 20036, (202) 328-5150.

Environmental Resource Program, University of North Carolina, Miller Hall, CB #8165, Chapel Hill, N.C. 27599, (919) 966-7754.

Environment 2010, Department of Ecology, P.O. Box 47600, Olympia, Wash. 98504, (206) 407-6157.

Florida Department of Environmental Protection, 3900 Commonwealth Blvd., Mail Station 10, Tallahassee, Fla. 32399, (904) 488-1554.

Florida House Foundation, 2477 Stickney Point Road, Suite 114A, Sarasota, Fla. 34231, (813) 922-5666.

Global Cities Project, 2962 Fillmore St., San Francisco, Calif. 94123, (415) 775-0791.

The Good Neighbor Project for Sustainable Industries, P.O. Box 79225, Waverly, Mass. 02179, (617) 489-3686.

Green Institute, 1033 E. Franklin Ave., Suite 7A, Minneapolis, Minn. 55404, (612) 874-1148.

Heartland Center for Leadership Development, 941 O St., Suite 920, Lincoln, Neb. 68508, (402) 474-7667.

Idaho Rural Development Council, Statehouse Room 122, Boise, Idaho 83720, (208) 334-3131.

BEST COPY AVAILABLE

Institute for Local Self Reliance, 2425 18th St. N.W., Washington, D.C. 20009, (202) 232-4108.

Institute for Sustainable Cities, 485 Leatherleaf Place, Sanibel, Fla. 33957, (813) 472-1450.

Izaak Walton League of America, Carrying Capacity Project, 707 Conservation Lane, Gaithersburg, Md. 20878, (301) 548-0150.

Jacksonville Community Council, Inc., JEA Tower, 11th Floor, 21 W. Church St., Jacksonville, Fla. 32202, (904) 356-0800.

Katuah Journal, P.O. Box 638, Leicester, N.C. 28748, (704) 254-6700.

Kentucky Long-Term Policy Research Center, Sullivan Square, Suite 100, 215 W. Main St., Frankfort, Ky. 40601, (502) 564-2851.

Leadership Task Force on Sustainable Economic Development, Washington State Department of Trade and Economic Development, 20001 Sixth Ave., Suite 2700, Seattle, Wash. 98121, (206) 464-6282.

Maine Community Foundation, P.O. Box 148, Ellsworth, Maine 04605, (207) 667-9735.

Maine Development Foundation, 45 Memorial Circle, Augusta, Maine 04330, (207) 622-6345.

Maine State Planning Office, Statehouse Station #38, Augusta, Maine 04333, (207) 287-3261.

Marblehead Community Organic Farm and Ecology Center, 38 High St., Marblehead, Mass. 09145, (617) 631-7214.

Maywood Project, Village of Maywood, 15 S. Fifth Ave., Maywood, Ill. 60153, (708) 450-4429.

Mega-Cities Project, New York University, 4 Washington Square North, New York, N.Y. 10003, (212) 998-7520.

Metro Washington Community Indicators Project, 1612 K St. N.W., Washington, D.C. 20006, (202) 872-5339.

Mid-Missouri Center for Sustainable Living, 804-C East Broadway, Columbia, Mo. 65201, (314) 875-0539.

Minnesota Sustainable Development Initiative, 658 Cedar St., St. Paul. Minn. 55155, (612) 297-5228.

National Community Education Association, 3929 Old Lee Highway, Suite 91-A, Fairfax, Va. 22030, (703) 359-8973.

Network for a Sustainable New York City, 150 W. 28th St., Suite 1501, New York, N.Y. 10001, (212) 645-2214.

Northhampton County Sustainable Development Initiative, P.O. Box 538, Eastville, Va. 23347, (804) 678-0477.

Northwest Environment Watch, 1402 Third Ave., Suite 1127, Seattle, Wash. 98101, (206) 447-1880.

Ocean Arks International, 1 Locust St., Falmouth, Mass. 02540, (508) 540-6801.

Partnership for Economic Growth and the Environment, State Capitol, Jefferson City, Mo. 65101, (314) 751-3599.

Plymouth Institute, University of Wisconsin Extension, 929 N. Sixth St., Milwaukee, Wis. 53203, (414) 528-8488.

President's Council on Sustainable Development, MS 7456-MIB, 1849 C St. N.W., Washington, D.C. 20240, (202) 208-7411.

Project Rebound, Washington State Energy Office, 809 Legion Way, SE, FA-11, Olympia, Wash. 98504, (206) 586-8142.

Renew America, 1400 16th St. N.W., Suite 710, Washington, D.C. 20036, (202) 232-2252.

Resident Resource Initiative, Metropolitan Boston Housing Partnership, 569 Columbus Ave., Boston, Mass. 02118, (617) 859-0400.

Rocky Mountain Institute, 1739 Snowmass Creek Road, Snowmass, Colo. 81654, (303) 927-3851.

Rural Action, 1 Mound St., Athens, Ohio 45701, (614) 593-7490.

Sierra Club Local Carrying Capacity Campaign, 408 C St. N.E., Washington, D.C. 20002, (202) 675-7901.

Sirius Community, Baker Road, Shutesbury, Mass. 01072, (413) 259-1251.

Southern Sustainability Initiative, Clemson University, Clemson, S.C. 29634, (803) 656-0214.

Southface Energy Institute, P.O. Box 5506, Atlanta, Ga. 30307, (404) 525-7657.

Sustainable Futures Society, 7652 Gartner Road, Evergreen, Colo. 80439, (303) 670-3711.

Sustainable Northwest, 620 S.W. Fifth St., Suite 1025, Portland, Ore. 97204, (503) 229-5171.

Sustainable Resource Center, c/o General Delivery, Crestone, Colo. 81131, (719) 256-4076.

Sustainable Cambridge Coalition, 27 Ellsworth Ave., Cambridge, Mass. 02139, (617) 491-6904.

Sustainable City Program, 200 Santa Monica Pier, Suite C, Santa Monica, Calif. 90401, (310) 458-2227.

Sustainable Community Roundtable, 2129 Bethel St. N.W., Olympia, Wash. 98506, (206) 754-7842.

Sustainable Oregon, 620 S.W. Fifth St., Suite 1025, Portland, Ore. 97204, (503) 229-5171.

Sustainable Seattle, Metro Center YMCA, 909 Fourth Ave., Seattle, Wash. 98104, (206) 382-5013.

Sustainable Urban Rural Enterprise, U.S. Department of Housing and Urban Development, Washington, D.C. 20410, (202) 708-2504.

Toward a Sustainable Environment, Secretary of the Environment, Harold Runnels Building, 1190 St. Francis Drive, P.O. Box 26110, Sante Fe, N.M. 87502, (505) 827-2850.

United Nations Association of the United States of America — Iowa Division, 20 E. Market St., Iowa City, Iowa 52245, (319) 337-7290.

Urban Earth, 6612 Piney Branch Road N.W., Washington, D.C. 20012, (202) 829-7112.

Urban Ecology, P.O. Box 10144, Berkeley, Calif. 94709, (510) 549-1724.

Urban Habitat Program, Earth Island Institute, 300 Broadway, Suite 28, San Francisco, Calif. 94133, (415) 788-3666.

Urban Resources Initiative, Yale School of Forestry, 205 Prospect St., New Haven, Conn. 06511, (203) 432-5119.

Urban Consortium, 1301 Pennsylvania Ave. N.W., Washington, D.C. 20004, (202) 626-2400.

Village Preservation and Improvement Society, P.O. Box 6824, Falls Church, Va. 22040, (503) 346-0675.

Western North Carolina Tomorrow, P.O. Box 222, Cullowhee, N.C. 28723, (704) 227-7429.

Zero Population Growth, 1400 16th St. N.W., Suite 320, Washington, D.C. 20036, (202) 332-2200.

Zuni Sustainable Resource Development Plan, P.O. Box 339, Zuni, N.M. 87327, (505) 782-4481.

COMMUNITY SUSTAINABILITY
TEACHER EVALUATION

Please complete the form below and return it to: Carrying Capacity Project, Izaak Walton League of America, 707 Conservation Lane, Gaithersburg, Md. 20878.

State in which you teach: _____ Date: _____

Grade level:_____ Amount of time used: _____

Subjects: _____

Circle all the answers that apply:
I used:

1) Sustainability Starting Point
2) Sustainability Snapshot
3) A Peek at the Past
4) Looking Ahead
5) Monitoring Sustainability
6) Sustainability Service Projects
7) Information Technology Connections
8) Glossary
9) Community Sustainability Directory

My school is:

1) urban
2) suburban
3) rural

My students are:

1) above grade average
2) at grade average
3) below grade average

My students are economically:

1) advantaged
2) average
3) disadvantaged

Overall rating of materials used:

1) very good
2) good
3) average
4) poor

Overall rating of student response:

1) very good
2) good
3) average
4) poor

OPTIONAL QUESTIONS

Your feedback is appreciated. Additional space for your responses is available on the back of this sheet.

How did you receive your copy of Community Sustainability?

How did you use this mini-curriculum in your classroom?

Which parts of the mini-curriculum were most successful?

-- additional questions on the back --

Which parts of the mini-curriculum were least successful? How can we improve these parts?

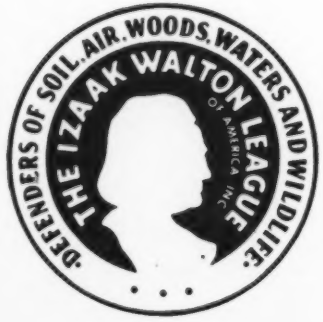
Did the teacher's pages provide sufficient background information?

What service learning project(s) did your students conduct?

Please tell us what you liked best about Community Sustainability.

Do you plan to use these materials again? How will you change the way you use them?

Additional comments:



Established in 1922 by a group of anglers concerned about water quality,
the Izaak Walton League of America is a national, nonprofit organization
with more than 50,000 members who protect and enjoy
the nation's soil, air, woods, waters and wildlife.

January 1996

The Izaak Walton League of America
707 Conservation Lane
Gaithersburg, MD 20878
(301) 548-0150